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A railway already follows the lower course of the Irrawadi, between Rangoon and Prome. This route has just been extended to Tungu on the Sitang, and ultimately will proceed to Mandelay, and even to Bhamo. A branch could be made at Mandelay, and touch the Me-Kong at Kiang-Tung, though in this comparatively short space it must cross at least eight mountain chains having a height of two thousand metres. One can imagine the inclination of the sides and the depth of the valleys among mountains so near each other. The Saluen flows seven hundred metres below the hills which border it: it is therefore out of the question to consider this.

Another project is to start from Bhamo, and to reach Talifu by Man-Wyne or Momein. In this territory the hills are even more marked, more abrupt, and steeper, than in the preceding, and the population is much to be feared. Even the Brahmapootra has been suggested: it is easily ascended to Sooja, partly by rail, partly by steam; but above this the route is impracticable, there being a rapid and uninterrupted succession of high mountains and high-banked rivers.

To summarize these data, the two Chinese rivers must be abandoned, not precisely on account of the difficulties of the territory, but because for a long time the celestial empire will be more or less impenetrable and dangerous for Europeans, and the course of the Me-Kong is too long and too hilly. The routes which traverse the bed of the Brahmapootra and the valley of the Irrawadi present such obstacles that they are impracticable. The route of the Saluen is more attractive; but it must not be forgotten, that, besides its length, it must cross two watersheds, one of which at least is very difficult, and must ascend the Me-Kong for a very long distance. The route by the Red River remains, which is not at all wonderfully accessible; but, to establish communications with Yun-Nan and with Se-Chuen, some obstacles must be surmounted; and this is the course which offers fewest of them. Beside the fact that it is shortest, it will not be necessary to cross mountains or to traverse valleys. The French recently sent a commission of engineers to survey for a railway between Tonquin and Burmah. We doubt whether this project can be realized; but these investigations will necessarily bring forth important data in regard to the penetration of western China.

THE GEOLOGY OF JAPAN.

THE Japanese geological bureau has prepared a series of maps illustrative of the geology of the Japanese archipelago, to be presented at the Geological congress at Berlin this year. The bureau was established in 1879, and includes topographical, geological, and agronomical departments, and a chemical and technical laboratory officered by Germans. The area already surveyed by the topographers is about eighty geographical miles square; and the whole country is expected to be surveyed and mapped in about eight years more. The geological survey has reached about the same extent as the topographical. The maps and

accompanying text are being published in both Japanese and English. The agronomical survey was begun in 1882. A map showing the knowledge at present attained, of the geological structure of Japan, is amongst the series. The observations made are summarized as follows: All the geological formations are met with in Japan. Gneiss occurs in small quantities in the neighborhood of Nagasaki and in the centre of the main island. Crystalline schists, consisting of mica, talc, marble, serpentine, etc., are found in Shikoku and the south-west of the main island. The paleozoic formations embrace the largest portion of the country, and are found everywhere. The mesozoic formation, including trias, jura, and chalk, is also known in Japan, but is not so prevalent as the previous one. Trias occurs in the north and south-west of the main island and in Shikoku. Chalk is found widely distributed in Yezo, the main island, and Shikoku. The cenozonic formation, including the tertiary and quaternary, is found everywhere on the edges of the older mountain ranges. In these formations numerous remains of mammals are found, especially of prehistoric elephants. Of the Plutonic rocks, granite is found widely distributed, and covers, next to the paleozoic formations, the widest area. The volcanic rocks consist mostly of trachyte and andesite: basalt is rare. Among the soils in Japan is the so-called tuff, i.e., volcanic tuff, which, for the most part, consists of decomposed silicates, and which is of great importance to agriculture. It is almost wholly unknown in Europe, while in Japan it forms the greater part of the so-called *hara*, which are the uncultivated plains at the foot of mountains, but which will bear cultivation. Accurate knowledge of this kind of soil will be of the utmost moment to Japanese agriculture. It is also noticeable that Japanese soils in general are very poor in chalk, and would therefore be improved by the addition of marl and chalk.

AMERICAN ENGINEERS AT DEER PARK.

THE annual convention of the American society of civil engineers, just held at Deer Park, Md., June 24-26, will be remembered as one at which more business was transacted, and more discussion elicited, than at any previous convention of the society. In fact, the limit in this direction may fairly be said to have been reached; and the thin attendance at the meetings of the last day was followed early in the afternoon by a motion, which was unanimously carried, that the reading of the remaining papers be dispensed with, as the members were too tired to listen to them. The experience at the conventions of the past few years had indicated the advisability of devoting less time than formerly to excursions and sight-seeing; and the meeting this year was therefore purposely held in a place offering little of local engineering interest, and where almost the whole time could be devoted to the business of the occasion.

The convention was attended by over one hundred